

DISCOVERY OF THE FAMILIES XYELIDAE, PAMPHILIIDAE,
BLASTICOTOMIDAE, AND ORUSSIDAE FROM TAIWAN,
WITH DESCRIPTIONS OF FOUR NEW SPECIES
(HYMENOPTERA: SYMPHYTA)

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Abstract.—Four sawfly families, Xyelidae, Pamphiliidae, Blasticotomidae, and Orussidae are newly recorded from Taiwan, and four new species are described: *Xyela meridionalis* (Xyelidae), *Blasticotoma smithi* and *Runaria taiwana* (Blasticotomidae), and *Orussus brunneus* (Orussidae). These are among the southernmost records for the families, except for the cosmopolitan family Orussidae, and eleven of the twelve Old World families of Symphyta are now known to occur in Taiwan. The southern records of the first three families are briefly reviewed and the following taxonomic changes are proposed: *Onycholyda subquadrata* (Maa), n. comb. (Pamphiliidae); *Runaria* Malaise, gen. rev., *Runaria reducta* Malaise, comb. rev. and *Runaria flavipes* Takeuchi, comb. rev. (Blasticotomidae).

The Symphyta fauna of Taiwan is doubtlessly very rich but yet insufficiently known. Of the twelve Old World families of Symphyta, only seven have been recorded from this island.

As a result of my recent collecting in central Taiwan and my studies of the sawfly collections in the National Science Museum (Nat. Hist.), Tokyo, and Kobe University, Kobe, I have discovered three additional sawfly families, Xyelidae, Pamphiliidae, and Blasticotomidae. According to our present knowledge, representatives of these families are mainly distributed in the temperate regions, and the records from Taiwan are among the southernmost records for each of the families. A Taiwanese specimen of another family of Symphyta, Orussidae, was found in the collection of the B. P. Bishop Museum, Honolulu, by D. R. Smith. This specimen represents the first record of this widely distributed but rarely found family from Taiwan. With the addition of the four families, eleven of the twelve Old World families of Symphyta are now known to occur in Taiwan. The sawfly families of this island are thus exactly identical with those of Japan.

In this paper I record the four families from Taiwan and describe four new species belonging to Xyelidae, Blasticotomidae, and Orussidae. A brief review of the southern records for each of the families, except for the cosmopolitan family Orussidae, and some taxonomic notes are also given.

XYELIDAE

Xyela meridionalis Shinohara, NEW SPECIES

Figs. 1, 5-9

Holotype female.—Head dull yellow with blackish-brown markings as in Fig. 6; epistomal suture and entire postgena blackish brown; gena dull yellow. Basal 3 segments of antenna brown with 3rd segment becoming blackish dorsally and towards apex; other segments blackish brown. Mouthparts dull yellow. Thorax blackish brown; dorsum with dark yellow markings as in Fig. 5; most of cervical sclerite, mesepisternum (except upper and posterior parts), and inner $\frac{1}{2}$ of mesobasisternum yellow. Legs dark yellow with bases of coxae blackish brown. Wings hyaline with veins and outer margin of stigma translucent dark brown; central part of stigma nearly colorless, translucent. Abdomen blackish brown to black; posterior part of hypopygium, lateroventral sides of 8th and 9th terga, narrow posterior margins of dorsal sides of 8th and 9th terga, 2nd valvifer, base of ventral part and extreme tip of 3rd valvula (= gonostylus), and cercus dark yellow.

Third segment of maxillary palpus much longer than scape of antenna (about 20:13) and wider than 3rd antennal segment. Antenna slightly shorter than thorax and abdomen (without sawsheath) combined or nearly twice as long as sawsheath; relative lengths of segments about 26:9:58:18:16:13:10:10:9:8:6:6. Sawsheath (2nd valvifer + 3rd valvula, Fig. 7) very short, slightly longer than 3 basal segments of antenna combined; 3rd valvula laterally flattened, distinctly shorter than 2nd valvifer (about 0.85:1.00 in lateral view); saw as in Figs. 8-9.

Body length (without sawsheath), 3.1 mm; forewing, 4.0 mm; sawsheath 1.2 mm.

Male and immature stages unknown.

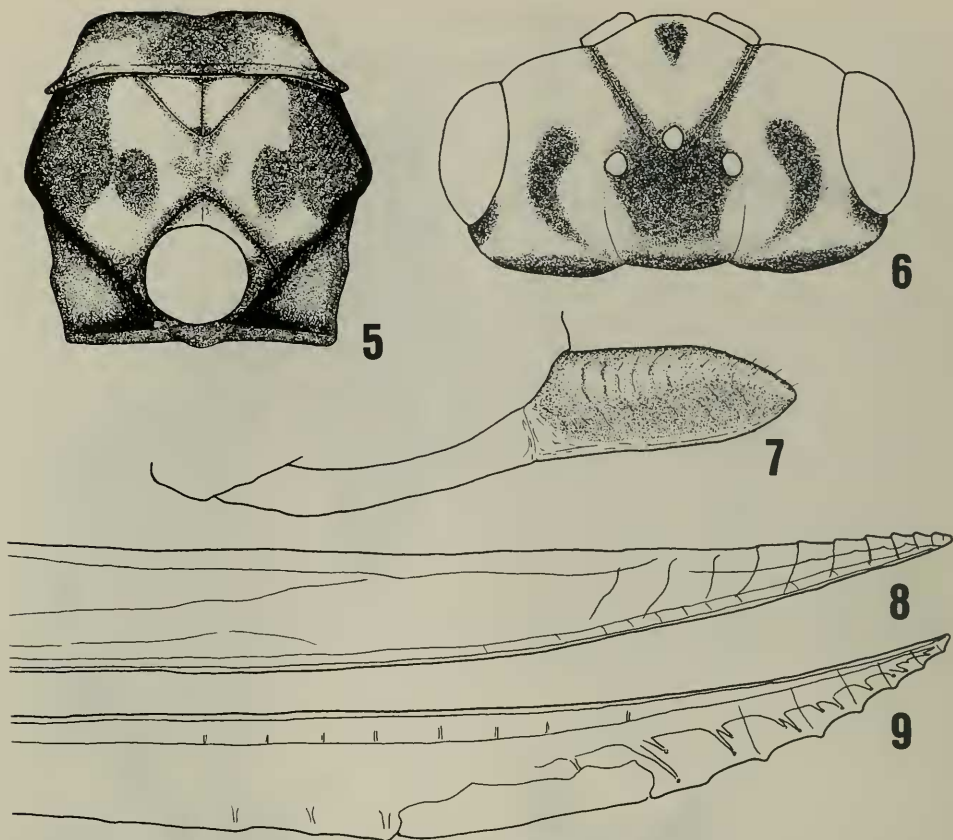
Holotype.—♀, Nanshanchi, nr. Puli, Nantou-Hsien, Taiwan. 15.III.1979. A. Shinohara. Deposited in the Entomological Laboratory, University of Osaka Prefecture, Sakai. The type-locality is a valley about 13 km east of the town of Puli, at about 24.01°N latitude. The holotype was swept from a pine tree (*Pinus* sp.) which was in an open pine grove on the eastern slope of the valley, at about 800 m alt.

Comparative comments.—*Xyela meridionalis* is a peculiar species, well characterized by the exceptionally short sawsheath. It is actually the only species in *Xyela* that has the third valvula (in lateral view) shorter than the second valvifer (Rasnitsyn, 1965). Among the previously known species, *X. menelaus* Benson from Greece has the shortest third valvula, which is, however, distinctly longer than the second valvifer (about 1.1:1.0, Benson, 1960). The ratio between the sawsheath length and the forewing length (about 1.0:3.3) is also very distinctive. *Xyela exilicornis* Maa from northwestern Fukien is known only from the male, and its relationship to *meridionalis* is not entirely certain. Although *exilicornis* differs markedly from *meridionalis* in the characters of the antennae, it is possible that these two are conspecific, because besides the possible sexual dimorphism, the instability of antennal characters in *Xyela* has been pointed out by Burdick (1961). It seems reasonable to me, however, to treat them distinct for the present.

Remarks.—The southernmost records of Xyelidae in Eurasia were those of *Xyela sinica* Maa and *Xyela exilicornis* Maa, both described from the Shaowu area, northwestern Fukien (about 27.21°N) (Maa, 1943, 1949). In North America, *Xyela*



Figs. 1-4. 1, *Xyela meridionalis*, holotype. 2, *Blasticotoma smithi*, holotype. 3, *B. smithi*, male paratype. 4, *Runaria taiwana*, holotype.



Figs. 5-9. *Xyela meridionalis*. 5, Thorax, dorsal view. 6, Head, dorsal view. 7, Sawsheath, lateral view. 8, Lance. 9, Lancet.

bakeri Konow, *X. dodgei* Greenbaum, *X. minor* Norton, *X. obscura* (Strobl), and *Megaxyela major* (Cresson) are known to occur in Florida (Smith, 1978). The southern range of Xyelidae appears, however, much wider than our previous knowledge, since representatives of *Xyela* have been found in Hong Kong and in the state of Michoacán in Mexico (D. R. Smith, personal communication).

PAMPHILIIDAE

Acantholyda sp.

This species is similar to *A. flavomarginata* Maa from Fukien but has a darker color pattern. It may represent a subspecies of *flavomarginata*.

Specimen examined.—1 ♀, Nanshanchi (about 800 m alt., 24.01°N), nr. Puli, Nantou-Hsien, Taiwan. 15.III.1979. A. Shinohara.

The specimen was swept from needles of an unidentified species of *Pinus* at the type-locality of *Xyela meridionalis*.

Remarks.—Records of Pamphiliidae from southern Eurasia are scattered. Maa (1944) described *Acantholyda flavomarginata*, *Acantholyda dimorpha*, Pamphi-

lius subquadratus, and *Pamphilius wongi* from the Shaowu area (about 27.21°N), northwestern Fukien. *Pamphilius subquadratus* belongs to the genus *Onycholyda* as redefined by Beneš (1972); *Onycholyda subquadrata* (Maa) NEW COMBINATION; confirmed by D. R. Smith from examination of paratypes. *Pamphilius wongi*, noted as having the structure of the head similar to that of *subquadrata* and the right mandible tridentate, probably belongs to *Onycholyda* too, though the description of the female alone does not allow definite decision. Maa (1949) recorded *A. flavomarginata* from Foochow (= Fuchou, about 26.09°N), eastern Fukien, and Hsiao (1963) added Kiangsi and Hunan to the distribution of both *A. flavomarginata* and *A. dimorpha*. Beneš (1972) described *Onycholyda birmanica* from Kambaiti at 2000 m alt. (about 25.25°N), northern Burma, and reported on the occurrence of "a probably still undescribed species of *Acantholyda* from Burma (cf. *flavomarginata* Maa)" (the details of the locality were not given but probably it is also from Kambaiti). I have seen two females of *Acantholyda* from southeastern China in the collection of the British Museum (Nat. Hist.), London; one (determined by Benson as "*Acantholyda? flavomarginata* Maa") is from Foochow and another (determined by Benson as "*Acantholyda* n. sp.") is from "Chienlisien, Kwangsi."

In North America, the southernmost records of Pamphiliidae include those of *Acantholyda credita* (Norton) and *A. variegata* (Norton) both from Mexico (Smith, 1971). The exact type locality is not known for *credita* but *variegata* is from Cordova [= Cordoba? 18.55°N]. According to D. R. Smith (personal communication), representatives of *Acantholyda* occur at least as far south as the states of Morelos and Vera Cruz, Mexico. Southern records of the subfamily Pamphiliinae are that of *Onycholyda amplexa* (Fabricius) from Miami (about 25.45°N) and that of *Pamphilius persicus* MacGillivray from Orlando (about 28.33°N), both in Florida (Middlekauff, 1964).

The data enumerated above suggest that *Acantholyda* and *Onycholyda* are the predominant, if not the only, genera of this family in the southern part of its range; other pamphiliid genera are almost missing in the areas south to 30.00°N.

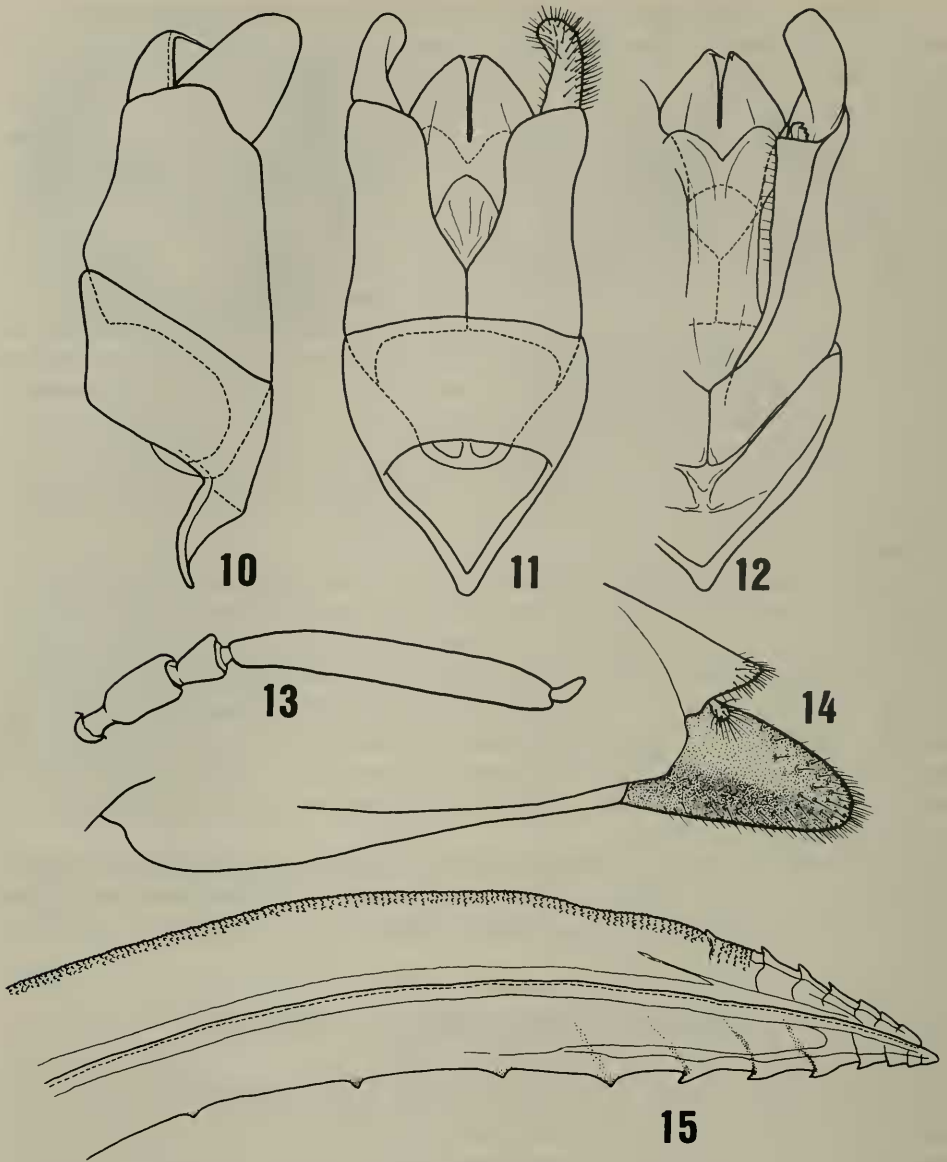
BLASTICOTOMIDAE

Blasticotoma smithi Shinohara, NEW SPECIES

Figs. 2-3, 10-15

Holotype female.—Head and thorax black; antenna slightly brownish; labrum, apex of mandible, and palpi blackish brown to dark ferruginous; tegula (except basal part) pale brown. Legs dark yellow with coxae and trochanters blackish brown. Forewing infuscated blackish brown, hindwing slightly so; veins and stigma blackish brown. Abdomen dark brown to black; apex of sawsheath pale.

Upper head smooth with slight rugosity and scattered punctures around ocellar area and along posterior margin; paraantennal field, supraclypeal area, clypeus, posterior and lower parts of gena coarsely but shallowly punctured. Fourth antennal segment (Fig. 13) slender, about 0.9× as long as maximum width of 3rd; ratio of 3rd antennal segment length to width of head (through compound eyes) 1.00:1.41. Thorax smooth; upper part of pronotum with shallow punctures and lower part coriaceous and/or aciculate; cervical sclerite with small punctures; ventral ½ of mesepisternum with scattered, distinct punctures, more densely punc-



Figs. 10-15. *Blasticotoma smithi*. 10-12, Genital capsule. 10, Lateral view. 11, Dorsal view. 12, Ventral view. 13, Antenna. 14, Sawsheath, lateral view. 15, Saw.

tured anteroventrally. Dorsal abdomen smooth and impunctate with propodeum distinctly coriaceous; ventral abdomen more or less coriaceous, partly with shallow, indistinct punctures. Sawsheath as in Fig. 14; saw as in Fig. 15.

Body length (excluding sawsheath), 7.5 mm; forewing length, 7.5 mm.

Male.—Similar to female in color and structure but smaller; body length 5.0-6.5 mm, forewing length 4.9-6.2 mm. Antenna relatively longer than in female;

ratio of 3rd antennal segment length to head width (through compound eyes) 1.00:1.19–1.22. Genitalia as in Figs. 10–12.

Immature stages unknown.

Types.—Holotype ♀, Tattaka [= Sungkang, about 2050 m alt., 24.05°N, Nantou-Hsien], Taiwan, 2.V.1929, K. Sato. Paratypes: 3 ♀, 2 ♂, same data as for holotype. The type-series is deposited in the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Variation (4 ♀ and 2 ♂ examined).—The specimens examined show little variation both in color and in structure. Body length (excluding sawsheath) in females varies from 7.5 to 8.3 mm (mean 7.9 mm). Forewing length in females varies from 7.4 to 8.0 mm (mean 7.7 mm). The ratio of the third antennal segment length to the head width (through compound eyes) in females ranges from 1.00:1.32 to 1.00:1.41 (mean 1.00:1.38) and that of the second valvifer length to the third valvula length in lateral view ranges from 2.19:1.00 to 2.29:1.00 (mean 2.25:1.00).

Comparative comments.—This species runs to *B. filiceti pacifica* Malaise from Japan in Takeuchi's (1939) key but differs from it chiefly in the smoother surface sculpture and the sparser punctuation of the body (notably on the mesepisternum) and the slightly brownish coloration of the antennae. There is a difference also in the shape and length of the fourth antennal segment; in *smithi*, it is slender and only slightly shorter than the maximum width of the third segment (0.86–0.93:1.00, mean 0.91:1.00, $n = 4$), whereas in *filiceti pacifica* it is thick and much shorter than the maximum width of the third segment (0.62–0.67:1.00, mean 0.65:1.00, $n = 7$).

This species is named in honor of Dr. D. R. Smith, U.S. Department of Agriculture.

Runaria taiwana Shinohara, NEW SPECIES

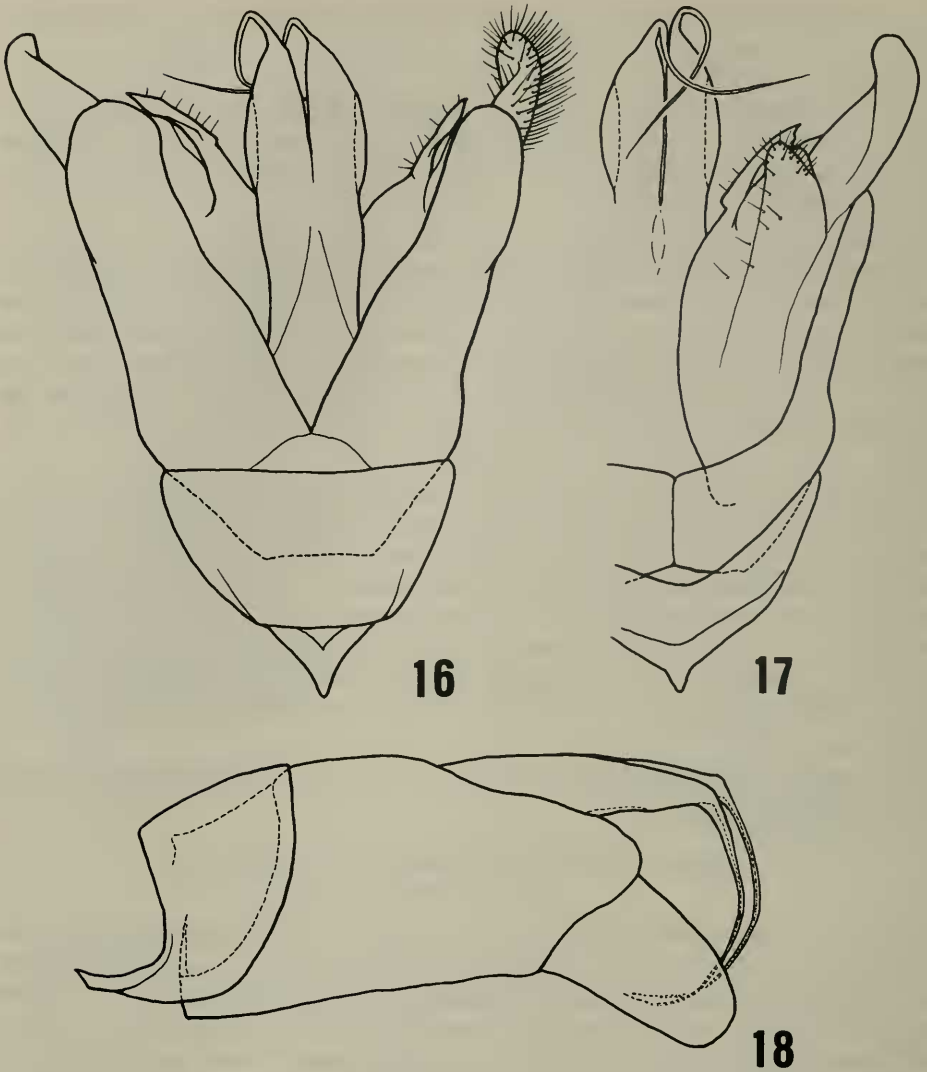
Figs. 4, 16–18

Holotype male.—Head and thorax black; apices of scape and pedicel and most of 3rd antennal segment slightly brownish; labrum pale brown; apex of mandible and palpi dark ferruginous; tegula blackish brown. Legs dark yellow with coxae (except for apical part of hindcoxa), foretrochanter and forefemur more or less dark brown; midtrochanter and part of hindtrochanter brownish. Wings very slightly infuscated brownish (more so on cell 3R1 of forewing) with veins and stigma blackish brown. Abdomen blackish brown, ventrally slightly paler.

Head shining with irregular, shallow, often indistinct punctures. Mesoscutellum smooth with only a row of distinct punctures along posterior margin. Mesepisternum smooth, not rugose, punctures not dense (in lateral part interspaces between punctures much larger than diameter of each puncture). Dorsal abdomen smooth, propodeum nearly impunctate (with narrow lateral margins densely punctate), 2nd tergum anteriorly with scattered, distinct, large punctures, 3rd to 5th with more dense, distinct, large punctures, 6th to 9th with rather indistinct punctures; ventral abdomen very weakly coriaceous or smooth, distinctly punctate except at apical part of each sternum. Genitalia as in Figs. 16–18.

Body length, 6.0 mm; forewing length, 5.5 mm.

Female and immature stages unknown.



Figs. 16-18. *Runaria taiwana*, genital capsule. 16, Dorsal view. 17, Ventral view. 18, Lateral view.

Types.—Holotype ♂, Tattaka [= Sungkang, about 2050 m alt., 24.05°N, Nantou-Hsien], Taiwan, 2.V.1929, K. Sato. Deposited in the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo. Paratype: 1 ♂, Hokuko-Kaminoshima onsen, Byoritsu-ken [Miaoli-Hsien], 11.IV.1967, T. Shirozu. Deposited in the Entomological Laboratory, Kobe University, Kobe.

Variation (2 ♂ examined).—The paratype differs from the holotype in having the legs (except for the bases of coxae) entirely dark yellow. Body length and forewing length of the paratype are 6.0 mm and 5.5 mm, respectively.

Comparative comments.—As *Blasticotoma smithi*, *Runaria taiwana* is well characterized by the smooth surface sculpture and the sparser punctation of the body. Among other features, the very smooth propodeum (where only a few

distinct punctures are present except at the densely punctate narrow lateral margins), and the mostly impunctate mesoscutellum (where the punctures are limited to the posterior margin) will easily distinguish *taiwana* from the two known living species, *R. reducta* Malaise and *R. flavipes* Takeuchi, both from Japan. *Bohea abrupta* Maa from northwestern Fukien differs from *taiwana* at least in having the "abdomen coarsely punctate" (Maa, 1944).

Remarks.—The Blasticotomidae are composed of only eight living and one fossil species in four genera in the world (Smith, 1978, and the discussion below). Of the six previously known living species, five occur in the temperate regions of the Far East and Europe, and one species, *Bohea abrupta* Maa, is from the Shaowu area, northwestern Fukien (about 27.20°N). The Taiwanese records (about 24.05°N) extend the southern distribution of this family considerably.

Zhelochovtsev and Rasnitsyn (1972) treated the genus *Runaria* as a synonym of *Paremphytus* Brues, a genus established for a fossil species *P. ostentus* Brues from Florissant, Colorado, USA (Miocene), and following them Smith (1975) transferred *Runaria reducta* Malaise and *Runaria flavipes* Takeuchi to *Paremphytus*. Zhelochovtsev and Rasnitsyn's conclusion is on the basis of "the completely reduced fourth antennal segment, the distal position of 2m-cu crossvein, and the short ovipositor" of *Paremphytus ostentus*. However, "the completely reduced fourth antennal segment" and "the short ovipositor" are not peculiar to *Runaria* and the former feature may be difficult to recognize in the holotype of *P. ostentus* (see citations from Brues in Benson, 1942). The distal position of 2m-cu crossvein alone is not enough to prove the synonymy of *Paremphytus* with *Runaria*. I would rather agree with Benson (1942) who said, "Unfortunately without the claws of the insect it is impossible to tell whether *Paremphytus* is likely to be synonymous with either of the two known recent genera of Blasticotomidae, *Blasticotoma* or *Runaria*," and treat *Paremphytus* and *Runaria* as distinct genera (*Runaria* Malaise, **gen. rev.**). The two living species of *Paremphytus*, *reductus* (Malaise) and *flavipes* (Takeuchi) are therefore transferred back to *Runaria*: *Runaria reducta* Malaise, **comb. rev.**, and *Runaria flavipes* Takeuchi, **comb. rev.**

The validity of the monobasic genus *Bohea* is not certain. According to Maa (1944), it is distinguished from *Runaria* only by having the fourth antennal segment "absent"; in *Runaria*, the fourth antennal segment is "present but indistinct." My study of this character in two species of *Runaria* shows that its condition is difficult to define. It could be described either as "absent" or "present but indistinct" according to individual authors. As Maa, when he described *Bohea*, probably had no specimens of *Runaria* for comparison and only referred to Malaise (1931), it is possible that *Bohea* and *Runaria* are synonymous.

ORUSSIDAE

Orussus brunneus Shinohara and Smith, NEW SPECIES

Fig. 19

Holotype female.—Body very dark brown. Head and dorsum of thorax darker, blackish. Mandibles pure black. Distinctly paler are: Anterior margin of frons; basal segments of antenna (becoming darker apically); spot at apex of 9th antennal segment; most of 10th antennal segment (except apex); palpi; trochanters; 7th sternum; and other sterna more or less. Yellowish white are: Spot at dorso-apical



Fig. 19. *Orussus brunneus*, holotype.

part of each femur; oblong spot covering basal $\frac{1}{2}$ of outer surface of foretibia; line on outer surface of midtibia, covering $\frac{9}{10}$ of its total length from base; basally widening line covering basal $\frac{1}{2}$ of outer surface of hindtibia (teeth in this line blackish towards apex). Forewing with apical $\frac{1}{3}$ and basal $\frac{1}{2}$ (gradually becoming hyaline towards base) infuscated; hindwing slightly infuscated towards apex.

Head coarsely reticulate-punctate. Anterior margin of frons with broad and shallow median notch. Gena with distinct carina along posterior orbit, running beyond upper margin of eye. Lateral ocellus situated between level of 3rd and 4th tubercle. Dorsum of thorax densely, finely punctate, mat; lateral aspect of mesepisternum coarsely reticulate-punctate; ventral aspect of mesepisternum very finely, not very densely punctate, interspaces shining. Mesoscutellum with anterior (except lateral parts) and posterolateral margins impunctate, polished; posterior angle rounded and distinctly less than 90° . Relative lengths of basal, costal, anal, and apical margins of cell 1M about 9:12:17:5.¹ Apex of 8th tergum rather simply, conically projected.

Body length, 5.4 mm; forewing length, 3.6 mm.

Male and immature stages unknown.

Holotype.—♀, Kuraru [= Kentin, Hengchun-Hsien], Taiwan, 5.V.1934, J. L. Gressitt. Deposited in the Department of Entomology, B. P. Bishop Museum, Honolulu.

Comparative comments.—*Orussus brunneus* is very similar to *O. decoomani* Maa, to which it runs in Yasumatsu's (1954) key, and to *O. rufipes* Tsuneki. The

¹ In Yasumatsu's (1954: 117) description of *O. boninensis*, the relative lengths of margins of the discoidal cell are given "6:12:19:11," but this should be "11:12:19:6," and the following "Apical margin: costal margin" should read "Anal margin: costal margin."

new species, however, may be distinguished by the distinctly brownish coloration of the body and by having the basal half of the forewing distinctly infuscated (gradually becoming hyaline towards base). From *rufipes*, *brunneus* also differs in the shape of eighth abdominal tergum in female; in *rufipes*, the produced apex of this plate is distinctly flattened laterally, while in *brunneus*, it is rather simple, not distinctly flattened.

Orussus decoomani and its allied forms are in need of revision. *Orussus decoomani* was originally described from a single male collected in northern Vietnam (Tonkin) (Maa, 1950). Later, Benson (1966) identified his Himalayan specimens (2 ♀, 2 ♂) with this species, but the specimens differed from Maa's original description in that "the infuscated stigmal transverse band is reduced" and "the tibia and tarsi are marked with white." Tsuneki (1963) described *O. rufipes* from Japan,² a species apparently close to *decoomani*. These three similar forms (including Benson's Himalayan "*decoomani*" as one) from widely separated localities have not been directly compared and it is possible that all are conspecific or each belongs to a distinct species. *Orussus brunneus* is an addition to this complex of species and its true status is not very certain until more is known about these species. Benson (1966) pointed out that *decoomani* differs from other *Orussus* species known to him (*abietinus* (Scopoli), *occidentalis* (Cresson), *sayi* (Westwood), *thoracicus* (Ashmead), and *unicolor* (Latreille)) in having the lateral ocellus situated between the level of the third and fourth tubercle. *Orussus brunneus*, *rufipes*, and *boninensis* Yasumatsu, from the Bonin Islands, are similar to *decoomani* in this character.

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LITERATURE CITED

- Beneš, K. 1972. Generic classification of the tribe Pamphiliini (Hymenoptera, Pamphiliidae). Acta Entomol. Bohemoslov. 69: 378-395.
- Benson, R. B. 1942. Blasticotomidae in the Miocene of Florissant, Colorado (Hymenoptera, Symphyta). Psyche (Camb., Mass.) 49(3-4): 47-48.
- . 1960. Two new European species of *Xyela* Dalman (Hymenoptera: Xyelidae). Proc. R. Entomol. Soc. Lond. (B) 29: 110-112.
- . 1966. Some sawflies new to the Himalayan region (Hymenoptera, Symphyta). Ann. Mag. Nat. Hist. (13) 8: 141-144.

² This species is known from Honshu and Shikoku and here first recorded from Hokkaido (2 ♀, 1 ♂, Horoka, Tokachi, 27.VII.1974, A. Shinohara).

- Burdick, D. J. 1961. A taxonomic and biological study of the genus *Xyela* Dalman in North America. Univ. Calif. Publ. Entomol. 17: 285-356.
- Hsiao, K.-J. 1963. A synopsis of Chinese sawflies of the subfamily Cephalciinae (Hymenoptera, Pamphiliidae). Sci. Silvae 8(1): 15-28. (In Chinese with English summary.)
- Maa, T.-C. 1943. Description of a new xyelid sawfly from Fukien (Hymenoptera: Chalastogastra). Biol. Bull. Fukien Christian Univ. 3: 61-63.
- . 1944. Novelties of Chinese Hymenoptera Chalastogastra. Biol. Bull. Fukien Christian Univ. 4: 33-60.
- . 1949. A synopsis of Chinese sawflies of the superfamily Megalodontoidea (Hymenoptera). Chin. J. Zool. 3: 30-42.
- . 1950. On some new Orussidae from Asia and Australia (Hymenoptera, Symphyta). Proc. R. Entomol. Soc. Lond. (B) 19: 23-34.
- Malaise, R. 1931. Neue japanische Blattwespen. Zool. Anz. 94: 201-213.
- Middlekauff, W. W. 1964. The North American sawflies of the genus *Pamphilius* (Hymenoptera: Pamphiliidae). Univ. Calif. Publ. Entomol. 38: 1-84.
- Rasnitsyn, A. P. 1965. Notes on the biology, systematics and phylogeny of Xyelinae (Hymenoptera, Xyelidae). Pol. Pismo Entomol. 35(12): 483-519. (In Russian with English summary.)
- Smith, D. R. 1971. The Neotropical sawflies described by Norton and Cresson, with lectotype designations (Hymenoptera: Symphyta). Trans. Am. Entomol. Soc. 97: 521-535.
- . 1975. New synonymy and combinations in sawflies (Hymenoptera: Symphyta). Proc. Entomol. Soc. Wash. 77(1): 99.
- . 1978. Suborder Symphyta (Xyelidae, Blasticotomidae, etc.). In van der Vecht, J. and R. D. Shenefelt, eds., Hymenopterorum Catalogus, Pars 14, vi + 193 pp. Dr. W. Junk b. v., The Hague, The Netherlands.
- Takeuchi, K. 1939. A systematic study of the suborder Symphyta (Hymenoptera) of the Japanese Empire (II). Tenthredo 2(4): 393-439.
- Tsuneki, K. 1963. A contribution to the knowledge of Orussidae in Japan with the description of a new species (Hymenoptera, Symphyta). Etizenia (2): 1-5.
- Yasumatsu, K. 1954. *Orussus boninensis*, a new species of Orussidae from the Bonin Islands (Hymenoptera). Insecta Matsumurana 18(3-4): 115-118.
- Zhelochovtsev, A. N. and A. P. Rasnitsyn. 1972. On some Tertiary sawflies (Hymenoptera, Symphyta) from Colorado. Psyche (Camb., Mass.) 79(4): 315-327.